

## Phone Number Filter User Interface

### TECHNICAL FIELD

The field of the invention is the operation of mobile telephone systems to filter incoming calls.

### BACKGROUND OF THE INVENTION

Today, mobile phones and their networks support the ability to forward unanswered and uncompleted calls to the network's voice mail system.

It is not, however, possible at present to filter incoming calls with any degree of sophistication. The voice mail answers anyone who calls, requiring in many systems that the user pay a fee for unwanted calls. Such fees can be quite annoying and can aggregate to a substantial amount of money, especially when the user is roaming or is in a foreign country.

In addition, the only way to avoid interruptions in a conference hall, important meeting, etc. is to shut off the mobile phone. Even if the user turns off the ringer on the phone, the vibrating mode will interrupt his thought process.

1 As telemarketers and other mass callers have become more aggressive  
2 and widespread, the fraction of unwanted calls increases.

3  
4 Shutting off the phone, of course, introduces the possibility of missing an  
5 important call, thus negating one of the main benefits of a mobile phone.

6  
7 It would be advantageous if the user were able to control the phone with  
8 more precision - allowing all calls, rejecting all but a selected group of  
9 callers, etc.

## 10 11 12 SUMMARY OF THE INVENTION

13  
14 The invention relates to a telephone system that permits the user to  
15 control access to the ringing and to the voice mail.

16  
17 A feature of the invention is the ability to set up a standard default pattern  
18 of accepted and rejected calls

19  
20 Another feature of the invention is the ability to change the pattern in  
21 response to a change in status, e.g. in a meeting or sleeping.

22  
23 Another feature of the invention is the ability to change the pattern  
24 automatically, e.g. by time of day.

## 25 26 27 BRIEF DESCRIPTION OF THE DRAWING

1 Figure 1 illustrates schematically a system using the invention.

2

3 Figure 2 illustrates factors involved in automatically selecting the current  
4 status.

5

6 Figure 3 lists various actions to be taken when a filter criterion is satisfied  
7 (responses).

8

9 Figure 4 lists various filters.

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11 Figure 5 shows steps in selecting and setting up a profile.

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#### 14 BEST MODE OF CARRYING OUT THE INVENTION

15

16 Figure 1 illustrates, in simplified form, a mobile telephone system in  
17 which a caller 5 dials the number of a Customer's mobile handset 20. The  
18 telephone system receives that call in a system receiver 10, illustratively a  
19 base station receiving a call from a mobile phone.

20

21 In the standard pattern, the call rings on the Customer's mobile handset  
22 20. If the handset is out of range of the mobile system, or the handset is  
23 turned off, System Processor 15 responds to Caller with a message,  
24 typically inviting Caller to leave a message on Customer's voice mail.

25

26 Some telephone systems offer additional services such as refusing calls  
27 from listed numbers, call waiting, etc. but these additional services are  
28 ordinarily not available to mobile phone users.

1 According to the invention, the functions available to Customer are  
2 increased by permitting the Customer to set up a set of profiles, which are  
3 a set of criteria that are applied to incoming calls and the action to be  
4 taken. Each set of criteria is called a filter and the action taken when the  
5 set of criteria is satisfied is called the response.

6

7 Bracket 260 in Figure 2 indicates a sample list of filters 260-1 to 260-N  
8 with names indicating when they are intended to be used:

9

10 - Default - the standard criterion for permitting calls to ring when no  
11 special status is specified

12

13 - Meeting - when the Customer is in a meeting that should not be casually  
14 interrupted

15

16 - Sleeping - when the Customer does not want to be awakened unless  
17 there is a specified occurrence (an emergency or a call from someone  
18 important)

19

20 - Driving - when the Customer is driving with his mobile phone on, but  
21 does not want to receive calls of lesser importance

22

23 - Traveling - when the Customer is in transit - on a plane, at the terminal  
24 and is probably temporarily out of range

25

26 -Time Zone - when the Customer is in another time zone (e.g. Europe or  
27 Asia) and wants to adjust his working hours

28

1 Home - when the Customer wants ordinary business calls to be directed  
2 to voice mail, but wants to receive social, non-business calls  
3  
4 Emergency Code - when the Customer wants to give callers who know a  
5 special code the ability to override the automatic rejection of their call  
6  
7 Those skilled in the art will readily be able to devise additional situations  
8 where a filter would be appropriate. An advantageous feature of the  
9 invention is the ability of the Customer to set criteria and/or to devise  
10 new filters.  
11  
12 The Customer will set the criteria according to his needs. For example,  
13 Customer would ordinarily reject calls from telemarketers by rejecting  
14 incoming calls that do not have caller ID data associated with them. If  
15 Customer gets a significant number of business calls from another  
16 country or location that does not pass on caller ID data to his phone  
17 company, he may need to put up with telemarketers in order to receive the  
18 wanted calls.  
19  
20 Those skilled in the art will also appreciate that the filters listed above are  
21 not mutually exclusive and may advantageously be combined - e.g. the  
22 Customer may set the status to Meeting when in a different time zone and  
23 may set the Emergency Code option in connection with any of the other  
24 filters. For example, Filter 4-4 permits the caller to override a rejection  
25 (from another filter) while Filter 4-8 permits a caller (Boss) to ring  
26 through without having to override the rejection.  
27  
28 A profile may have different filters associated with it, depending on the

1 time of day and status. For example, the filter for traveling in Europe will  
2 have different and more stringent criteria for accepting a call when  
3 sleeping than during local business hours, e.g. sending to voice mail all  
4 calls not on a list of business and family numbers. Thus, the same caller  
5 may be passed through at one time and sent to voice mail at another time.

6  
7 Referring again to Figure 2, the upper part of the Figure shows a number  
8 of boxes - Time of Day (210), Location (212) and Status (214) connected  
9 to a box 250 labeled Status Code. This portion of the Figure represents a  
10 portion of logic in system for changing filters (which may be automated).  
11 For example, box 210 would change the code to Sleeping at a preset time  
12 and the response associated with sleeping status would be applied; e.g. a  
13 message would inform the caller that Customer is traveling in Europe  
14 (where it is night) and request a voice message.

15  
16 Box 212 represents an optional feature in which the system processor in  
17 the local phone company reacts to the handset making contact by storing  
18 the information that the Customer is in range (as usual) and also setting a  
19 flag in the processing system to change the location and associated  
20 profiles. As an example, the local phone company would pass a message  
21 back to the processor in the home phone company to change the status  
22 code to reflect the appropriate location.

23  
24 Box 214 represents another optional feature in which status flags, e.g.  
25 sleeping, travel, etc. may be set, with the system automatically (e.g. at a  
26 preset time) changing the filter and response appropriately.

27  
28 This feature also permits Customer to turn on or off preset responses in

1 manual mode without re-keying all the details; e.g. setting status to travel  
2 with indefinite duration, then resuming Time Zone or Default status when  
3 ready.

4  
5 Figure 3 shows a list of sample responses that may be used:  
6

- 7 1. Transfer immediately to voice mail without ringing.
- 8 2. Refuse to answer without ringing.
- 9 3. Ringing without the option of leaving a message.
- 10 4. Ringing with transfer to voice mail after n rings.
- 11 5. Silent ringing (vibration or visual alert) without the option of  
12 leaving a message.
- 13 6. Silent ringing with transfer to voice mail after n rings.
- 14 7. Refuse to answer with the option of caller entering a code to  
15 override the rejection and ring through.
- 16 8. Forward the call to a backup.
- 17 9. Give the caller an option to leave a message or be forwarded to a  
18 backup.
- 19 10. Ring through for callers on a list.
- 20 11. Alert User and present a set of choices such as ring, transfer,  
21 voice mail.
- 22 12. Transfer to voice mail callers on a list.

23  
24 Alternative 1) is suitable for situations in which Customer is unable (in a  
25 plane or driving in a state where phoning while driving is illegal) or  
26 highly reluctant to answer. Alternative 2) is suitable if the call can be  
27 identified as a telemarketer. Alternatives 8) and 9) are suitable when  
28 Customer gets a large number of business calls that can be handled by a

1 backup.

2

3 Figure 4 shows a list of criteria that may be used in a filter:

4

- 5 1. Reject calls with no caller ID (anonymous or unknown).
- 6 2. Reject calls from country code and/or area code.
- 7 3. Reject calls from a list of numbers (optionally with wild card
- 8 characters).
- 9 4. Permit caller to enter a code to override the rejection.
- 10 5. Pass only calls from a list of numbers (optionally with wild card
- 11 characters).
- 12 6. Challenge before sending to voice mail.
- 13 7. Challenge before ringing through.
- 14 8. Ring through without challenge (listed numbers).

15

16 Setting up the Default profile and the other profiles would preferably be  
17 done from the mobile handset, though the phone company might permit  
18 its customers to use an Internet site to access their profiles. Optionally,  
19 the Customer could be permitted to modify the profile from any  
20 telephone, after entering a security code.

21

22 With the limited interface resources of a handset, consideration should be  
23 given to the sequence of operations to minimize the time and effort  
24 required of the Customer to manage the profiles.

25

26 Figure 5 illustrates a possible sequence of operations:

27

28 The first screen would present a list of profiles that have been set up in



1 advance - Default, Traveling, Time Zone, etc. The Customer could select  
2 a profile and use the preset parameters associated with it. After  
3 highlighting the profile name, the system would offer a choice of Edit the  
4 profile or Exit. For example, the Default profile might have: Sleeping  
5 from 11pm to 8am, Traveling from 8am to 9am, Business from 9am to  
6 6pm, Traveling from 6pm to 7pm and Home from 7pm to 11pm.

7  
8 A non-Default profile could be set by highlighting the profile name and  
9 entering relevant parameters. If the Customer wanted to modify a profile,  
10 the sequence would be to highlight the profile and press a key to enter  
11 Edit mode, where changes could be made (temporary or permanent).  
12 After each change, the Customer would have a choice of Exit or Continue  
13 Editing.

14  
15 For example, a sequence for a business trip could be:  
16 Customer would highlight Travel, enter a start time and stop time; then  
17 highlight Time Zone and enter the start and stop times. For example,  
18 Customer is traveling to Europe, leaving the office Monday afternoon  
19 (start of Travel profile) and arriving at the branch office 9am GMT on  
20 Wednesday. The modified business travel schedule would start with the  
21 arrival in the office, with modification for business dinners and sleeping  
22 on the local time schedule.

23  
24 For temporary changes, Customer could highlight the appropriate status  
25 and enter: start time and stop time (or indefinite).

26  
27 For example, Customer is called to an important meeting that is not  
28 regularly scheduled. He highlights Meeting and enters start and stop

1 times.

2

3 An optional feature of the invention is that, with appropriate software, the  
4 System Processor in the local phone company can automatically change  
5 the status of Customer.

6

7 Referring back to Figure 1, System receiver 10, the closest base station to  
8 Customer's office, is in contact with other base stations of the same phone  
9 company and with other phone companies, in order to handle roaming  
10 calls that originate or terminate in the territory of the other telephone  
11 company.

12

13 When Customer is out of the office, his handset makes contact  
14 periodically with a local base station, so that the phone company can  
15 route incoming calls correctly. System processor 15, therefore, has  
16 access to Customer's location. It is within the skill of ordinary  
17 programmers, therefore, to modify the profile as though Customer had  
18 done it according to Figure 2. For example, if Customer travels from his  
19 usual work location on the East coast to California, System Processor 15  
20 would change the profile to Time Zone and switch to the profile set up  
21 for West coast time. Since the area of cells in a mobile network is  
22 relatively small, a telephone company could offer another option of  
23 recognizing when Customer is at the airport and changing the status to  
24 Traveling.

25

26 Although the invention has been described with respect to a limited  
27 number of embodiments, those skilled in the art will appreciate that other  
28 embodiments may be constructed within the spirit and scope of the

1 following claims.

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